is attached as **Exhibit B**.

REMARKS

Claims 1, 2 and 14-33 are pending and presented for examination in connection with the subject application. Applicants have hereinabove amended independent claims 1 and 14.

Claims 1 and 14 have been amended to place the claims in better form for examination. Support for the amendments to claims 1 and 14 may be found, inter alia, in the specification at page 9, lines 4-17, page 15, lines 5-12, page 21, lines 12-20, and page 25, line 19 through page 26, line 4. Further support for the amendments to claims 1 and 14 may be found, inter alia, in FIGS. 2-5 and 9.

Applicants maintain that no new matter and no new issues are presented by this amendment. Accordingly, Applicants respectfully request that this Amendment be entered.

Rejection Under 35 U.S.C. §102(b)

In Section 2 of the May 8, 2002 Office Action, claims 1, 14 and 22 were rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No. 5,185,641 to Igushi et al. (hereinafter "Igushi '641").

The Examiner referred Applicants to the October 4, 2001 Office Action for the basis of the rejection.

Applicants maintain that the claimed invention cannot be anticipated by Igushi '641 because Igushi '641 fails to disclose each and every element of the claimed invention.

Claim 1 relates to a particle size distribution analysis apparatus. The particle size distribution analysis apparatus comprises a sample measurement zone, a light emitting means and at least a first detection means. The sample measurement zone defines a sample of particles. The light emitting means provides a source of light incident upon the sample measurement zone. The first detection means measures light levels in the apparatus at particular scattering angles and outputs a signal to a computation means for calculating the particle size distribution enabling the particle size distribution of particles contained within said sample to be determined. The computation means calculates, in use, the particle size distribution taking into account, for each of the scattering angles, reflection, by at least one window of the measurement zone, of light that has previously been scattered by said particles.

Claim 14 relates to a method of improving the accuracy of a particle size distribution calculation performed by illuminating a sample with light from a light emitting means and measuring an amount of light scattered by the sample. The method comprises providing at least a first detection means and calculating the particle size distribution taking into account reflection by at least one window of measurement zone of light, that has previously been scattered by the particles at at least two scattering angles.

Claim 22 relates to a particle size distribution analysis apparatus. The apparatus comprises a cell for containing a sample of particles, a monochromatic light source for illuminating the sample, first and second photodetectors for measuring light scattered by the particles, a processor for

processing measurements of the scattered light such that a reflection, by a surface of the cell, of light that has previously been scattered by said particles are taken into account when calculating the particle size distribution.

Igushi '641, as understood by Applicants, relates to use of a transmission obscuration measurement (see for example Figure 4 of Igushi '641) comprising noting the difference between a transmitted intensity of light through a measurement apparatus without a particulate sample present in the apparatus and a transmitted intensity with the sample present in the apparatus. Obscuration measurement technique such as disclosed in Igushi '641 compensate for attenuation of light which is transmitted through a measurement apparatus to a detector. The attenuation increases as particulate concentration increases and can be approximated to a Beer-Lambert like relationship, as shown in, for example, Equation 1 below.

Equation 1 $$\frac{I'}{I} = 10^{-ecx}$$

where: I' is intensity in presence of sample,
I is intensity in absence of sample,
e is extinction coefficient,
c is concentration of sample, and
x is path lengths of sample.

Obscuration measurement techniques do not take into account light reflected from a window of a measurement zone, or cell surface, of a measurement apparatus, as provided by the claimed invention of the subject application. Indeed, obscuration measurements

make no attempt to compensate for such reflections.

Obscuration measurements relate to a phenomenon that is independent of the angular position of detection, i.e. they result in a scaling factor that can be applied to all sample measurements irrespective of the angular position of the detector.

In contrast, the claimed invention takes into account the effect of reflection of light, which has been scattered by a particle, from a window of a measurement zone of light, or from a cell surface, in a measurement apparatus which is highly dependent upon angle of incidences of the scattered light as shown, for example, below in Equation 2, and hence the reflected angle of the light.

Equation 2 $$R_{\theta_i} = \left(\frac{n_2 \cos\theta_i - n_1 \cos\theta_i}{n_2 \cos\theta_i + n_1 \cos\theta_i} \right)^2$$

where: R is reflectivity,

n_1 is refractive index of first medium,

n_2 is refractive index of second medium, and

θ_i is angle of incidence of radiation at interface between media.

Thus, angular dependence of an effect of reflectance from windows of a measurement zone of light, or a cell surface, in a measurement apparatus clearly distinguishes the claimed invention from conventional techniques which operate from the simple linear, non-angularly dependent obscuration effect and requires different compensatory considerations. It is also evident that

the two effects originate from respective differing physical processes.

It is not the intention of Igushi '641 to correct the scattering matrix to incorporate, and dynamically model, the effects of a background. Igushi '641 states quite clearly that the background is fitted as a static function. A weight of the background which is required in the inversion process to remove the effect of background from the total data obtained during a sample measurement is modeled, according to Igushi '641, using this static function. The final particle size distribution is then assumed, according to Iguishi '641, to be the sum of the sample measurement and the background component which is simply discarded since it has served its purpose for fitting of the background component of the signal.

Accordingly, background compensation, according to Igushi '641, is treated as a static function regardless of the kind of particles measured, i.e. it is a function of the optical configuration only and is obtained by a separate background measurement taken without sample particles present.

Background correction of the present application may include in effect producing a set of modified scattering matrices in which a physical model of reflections is used to take the original scattering matrices predicted from Mie Theory and to correct them to take into account reflections by the cell windows.

The obscuration measurement techniques disclosed in Igushi '641 are intended to compensate for background light from the cell. In contrast, the claimed invention compensates for redirected

scattering of light from the sample itself caused by windows of a measurement zone of light, or from a cell surface, in a measurement apparatus. This scattering signal is not independent of the sample being measured and thus cannot be measured for the apparatus in advance and then applied to any sample.

Different sized samples scatter light with different angle/intensity profiles and the windows of a measurement zone of light, or a cell surface, in a measurement apparatus reflect this signal back with a similarly unique scattering signal. To correct for the scattering, as described in the subject application, the scattering signal for all sizes is predicted and then is used to fit the corresponding overall signal. This may be achieved by providing a modified set of scattering matrices in which the possible scattering signals have been precoded so that the correct result is extracted from the data.

Thus, when the analysis is performed and different candidate size distributions are fitted and adjusted, according to the subject application, the theoretical prediction of the scattering contains a prediction of the effects of reflection for that distribution. The prediction takes into account the sample-dependent reflections which cannot be measured accurately in advance of measuring the sample.

The apparatus and method claimed in the present application compensate for the effect of reflectance from windows of a measurement zone of light, or a cell surface, of a measurement apparatus. This is clearly different from the scalar obscuration compensation described in Igushi '641 at column 6 lines 42 to 68, column 7 lines 1 to 5, and column 7 lines 13 to 54 and in Figure

4.

The claimed invention recited in amended independent claims 1 and 14 provides for calculating particle size distribution taking into account reflection by at least one window of measurement zone of light which has been scattered by the particles, or a cell surface of a particle size distribution analysis apparatus, and thereby improves an accuracy of the calculations and obtains a more accurate prediction of the particle size distribution. Igushi '641 simply does not disclose or suggest such features.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1, 14 and 22 under 35 U.S.C. §102(b).

Rejection Under 35 U.S.C. §103(a)

In Section 4 of the May 8, 2002 Office Action, claims 2, 15-21 and 23-33 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Igushi '641.

The Examiner referred Applicants to the October 4, 2001 Office Action for the basis of the rejection.

Applicants maintain that Igushi '641 does not render obvious the claimed invention.

As discussed above, the claimed invention recited in amended independent claims 1 and 14 provides for calculating particle size distribution taking into account reflection by at least one window of measurement zone of light that has previously been scattered by the particles. Claims 2 and 23-33 depend on and

include all the features of claim 1. Claims 15-21 depend on and include all the features of claim 14.

Igushi '641 simply does not disclose or suggest such feature. Therefore, the claimed invention is patentable over Igushi '641.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 2, 15-21 and 23-33 under 35 U.S.C. §103.

In view of the amendments to the claims and remarks hereinabove, Applicants maintain that claims 1, 2 and 14-33 are now in condition for allowance. Accordingly, Applicants earnestly solicit the allowance of claims 1, 2 and 14-33.

If a telephone interview would be of assistance in advancing prosecution of the subject application, Applicants' undersigned attorney invites the Examiner to telephone him at the telephone number provided below.

If a petition for a further extension of time is required to make this response timely, this paper should be considered to be such a petition, and the Commissioner is authorized to charge the requisite fees to our Deposit Account No. 03-3125.

No fee, other than the enclosed $110.00 fee for a one-month extension of time, is deemed necessary in connection with the filing of this Amendment. However, if any additional fee is required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,

John P. White

John P. White
Registration No. 28,678
Attorney for Applicants
Cooper & Dunham LLP
1185 Avenue of the Americas
New York, New York 10036
(212) 278-0400

I hereby certify that this correspondence is being deposited this date with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Box AF, Washington, D.C. 20231.

John P. White — 9/6/02

John P. White — Date
Reg. No. 28,678

1. (Twice Amended) A particle size distribution analysis apparatus comprising a sample measurement zone defining a sample of particles, a light emitting means for providing a source of light incident upon the sample measurement zone, and at least a first detection means for measuring light levels in the apparatus at particular scattering angles and output a signal to a computation means for calculating said particle size distribution enabling the particle size distribution of particles contained within said sample to be determined, wherein said computation means calculates, in use, said particle size distribution taking into account [reflections] , for each of said scattering angles, reflection, by at least one window of said measurement zone, of light that has previously been scattered by said particles.

14. (Twice Amended) A method of improving the accuracy of a particle size distribution calculation performed by illuminating a sample with light from a light emitting means and measuring an amount of light scattered by the sample comprising providing at least a first detection means and calculating the particle size distribution taking into account reflection by [a] at least one window of measurement zone of light, that has previously been scattered by the particles at at least two scattering angles.

B1

1. (Twice Amended) A particle size distribution analysis apparatus comprising a sample measurement zone defining a sample of particles, a light emitting means for providing a source of light incident upon the sample measurement zone, and at least a first detection means for measuring light levels in the apparatus at particular scattering angles and output a signal to a computation means for calculating said particle size distribution enabling the particle size distribution of particles contained within said sample to be determined, wherein said computation means calculates, in use, said particle size distribution taking into account, for each of said scattering angles, reflection, by at least one window of said measurement zone, of light that has previously been scattered by said particles.

B2

14. (Twice Amended) A method of improving the accuracy of a particle size distribution calculation performed by illuminating a sample with light from a light emitting means and measuring an amount of light scattered by the sample comprising providing at least a first detection means and calculating the particle size distribution taking into account reflection by at least one window of measurement zone of light, that has previously been scattered by the particles at at least two scattering angles.